

A photograph of a creek, identified as Neabsco Creek, with a sandy bar in the middle. The background is a dense green forest. The text "Neabsco Creek" and "Total Maximum Daily Load Study" is overlaid in white.

Neabsco Creek

Total Maximum Daily Load Study

**Technical Advisory Committee Meeting
Woodbridge, Virginia
July 18, 2007**

Meeting Agenda

- **Review Neabsco Creek Impairment and the TMDL Process**
- **Updates from Last TAC Meeting**
- **Next Steps**
- **Questions**

Neabsco Creek Bacteria Impairment

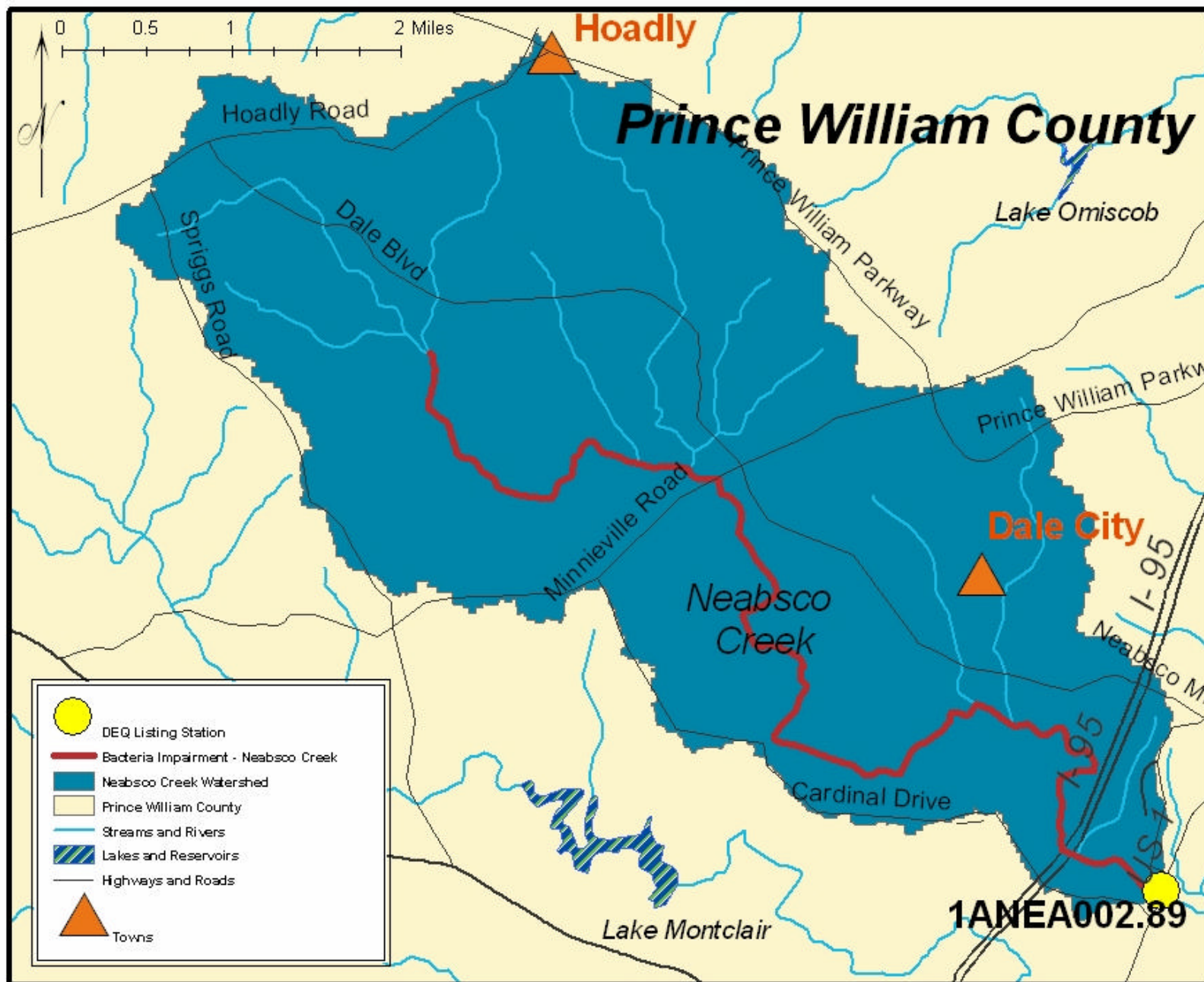
- TMDL study is being done for the non-tidal portion of Neabsco Creek
- Does not meet the Recreational Use – exceeds the water quality standards for Fecal Coliform and E. Coli Bacteria.

| Stream Name | Locality | Impairment | Length (miles) | Upstream Limit | Downstream Limit |
|---------------|-----------------------|------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Neabsco Creek | Prince William County | Bacteria | 8.42 | Confluence with an unnamed tributary to Neabsco Creek, near Dale City and approximately 0.4 rivermiles downstream from Route 784 (on the tributary) | Start of the tidal waters of Neabsco Bay (just downstream from the Route 1 Bridge Crossing) |

| Monitoring Station | Station Location | Fecal Coliform Exceedance Rate Recorded for the 2006 Assessment (01/01/2000 – 12/31/2004) |
|--------------------|------------------|-------------------------------------------------------------------------------------------|
| 1ANEA002.89 | Route 1 Bridge | 5 of 17 samples (29%) |

| Monitoring Station | Station Location | Bacteria Exceedance Rates Recorded for 01/01/2001 – Current** | |
|--------------------|------------------|---------------------------------------------------------------|----------------|
| | | Fecal Coliform | <i>E. coli</i> |
| 1ANEA002.89 | Route 1 Bridge | 3 of 14 (21%) | 8 of 23 (35%) |

** Includes Prince William County Data from 7/2003 to 6/2004.



What is a TMDL ?

Total Maximum Daily Load

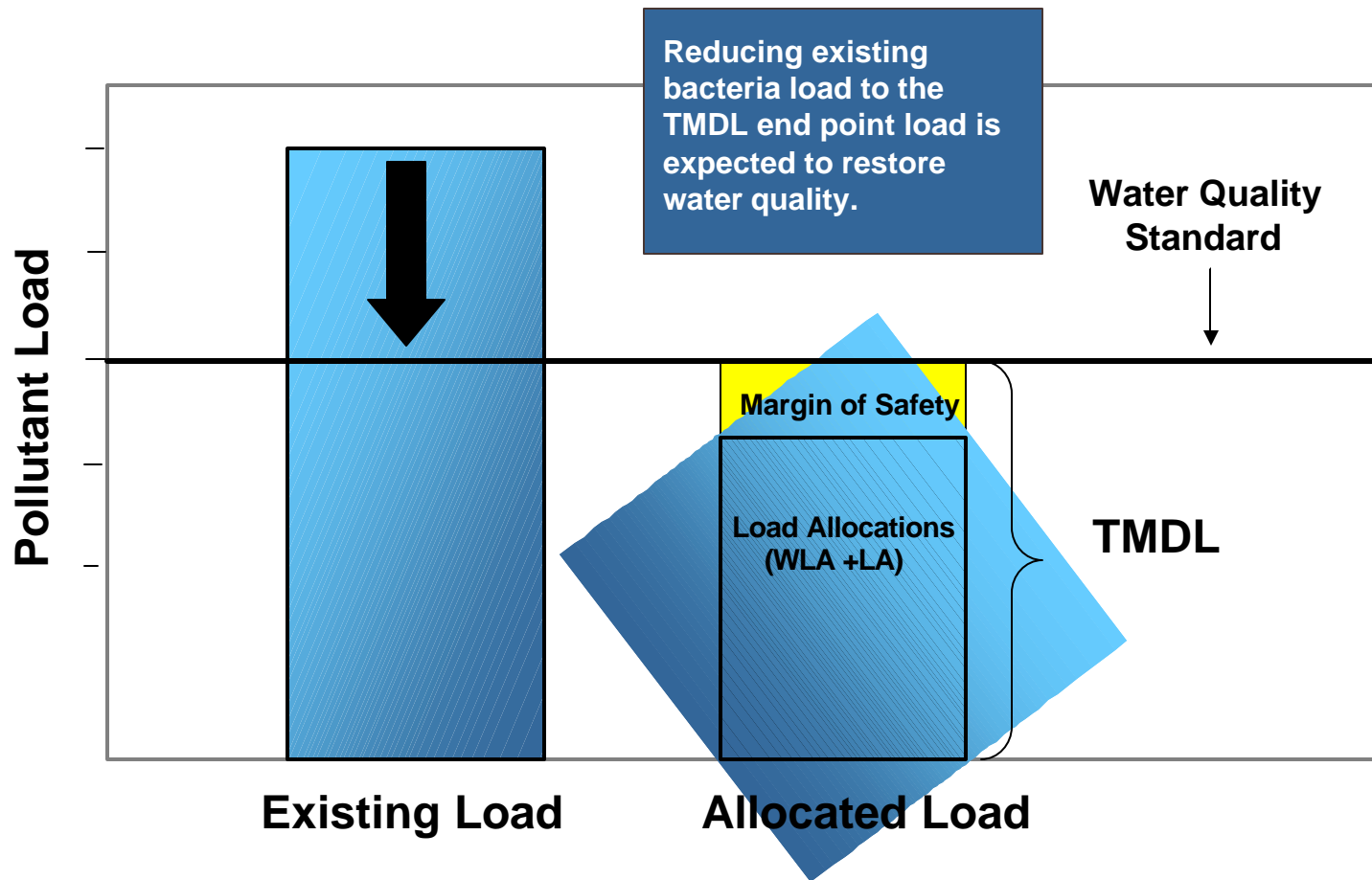
$$\textbf{TMDL = Sum of WLA + Sum of LA + MOS}$$

Where:

TMDL = Total Maximum Daily Load
WLA = Waste Load Allocation (point sources)
LA = Load Allocation (nonpoint sources)
MOS = Margin of Safety

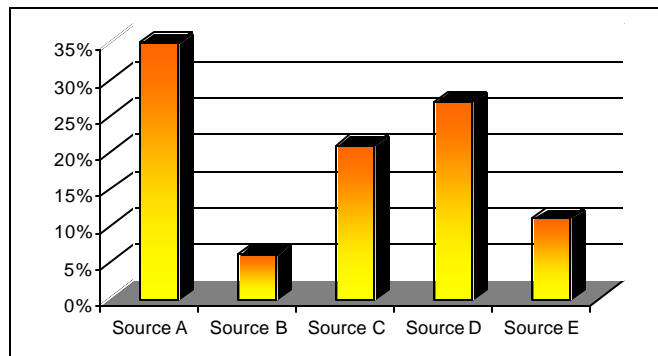
A TMDL is the amount of a particular pollutant that a stream can receive and still meet Water Quality Standards.

An Example TMDL



We are here

TMDL Study

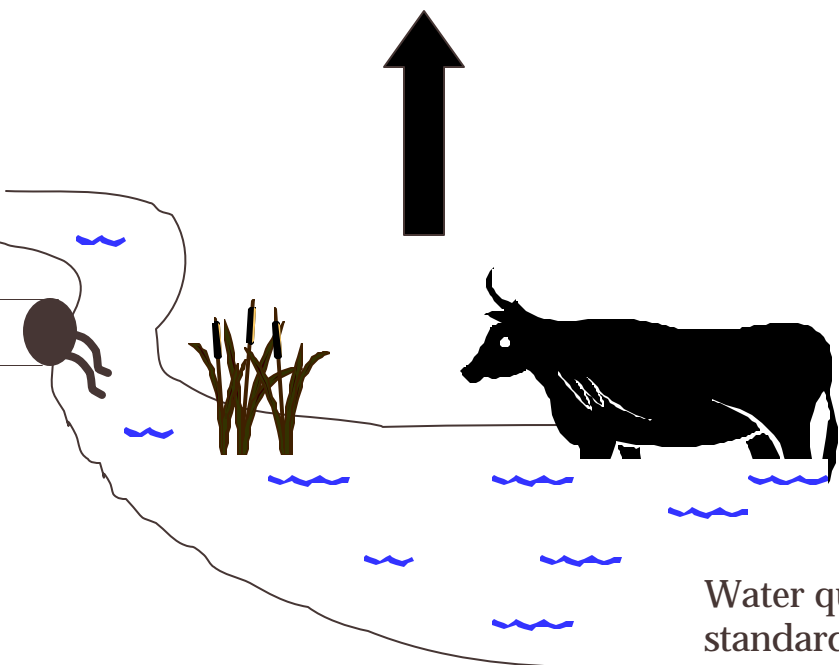


Implementation Plan

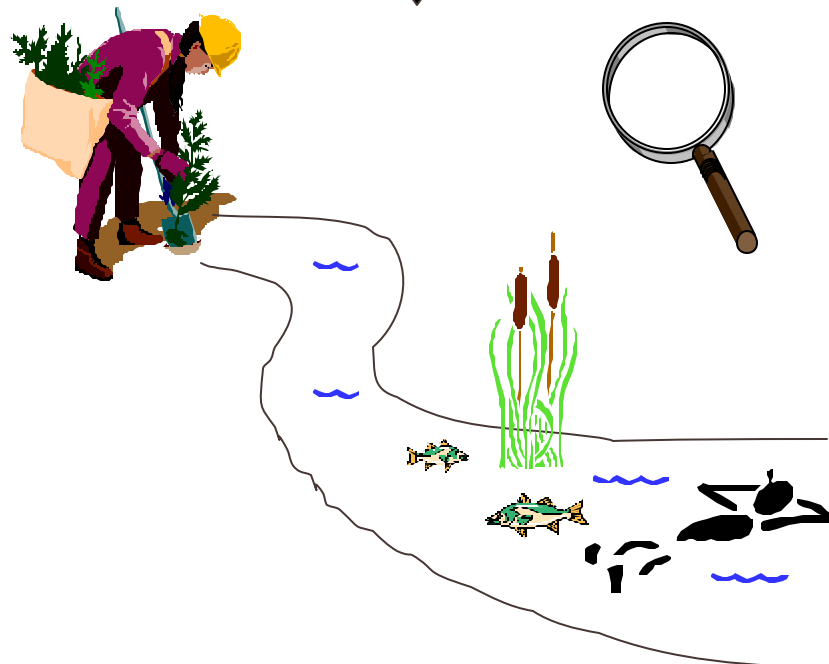


Implementation

Monitoring



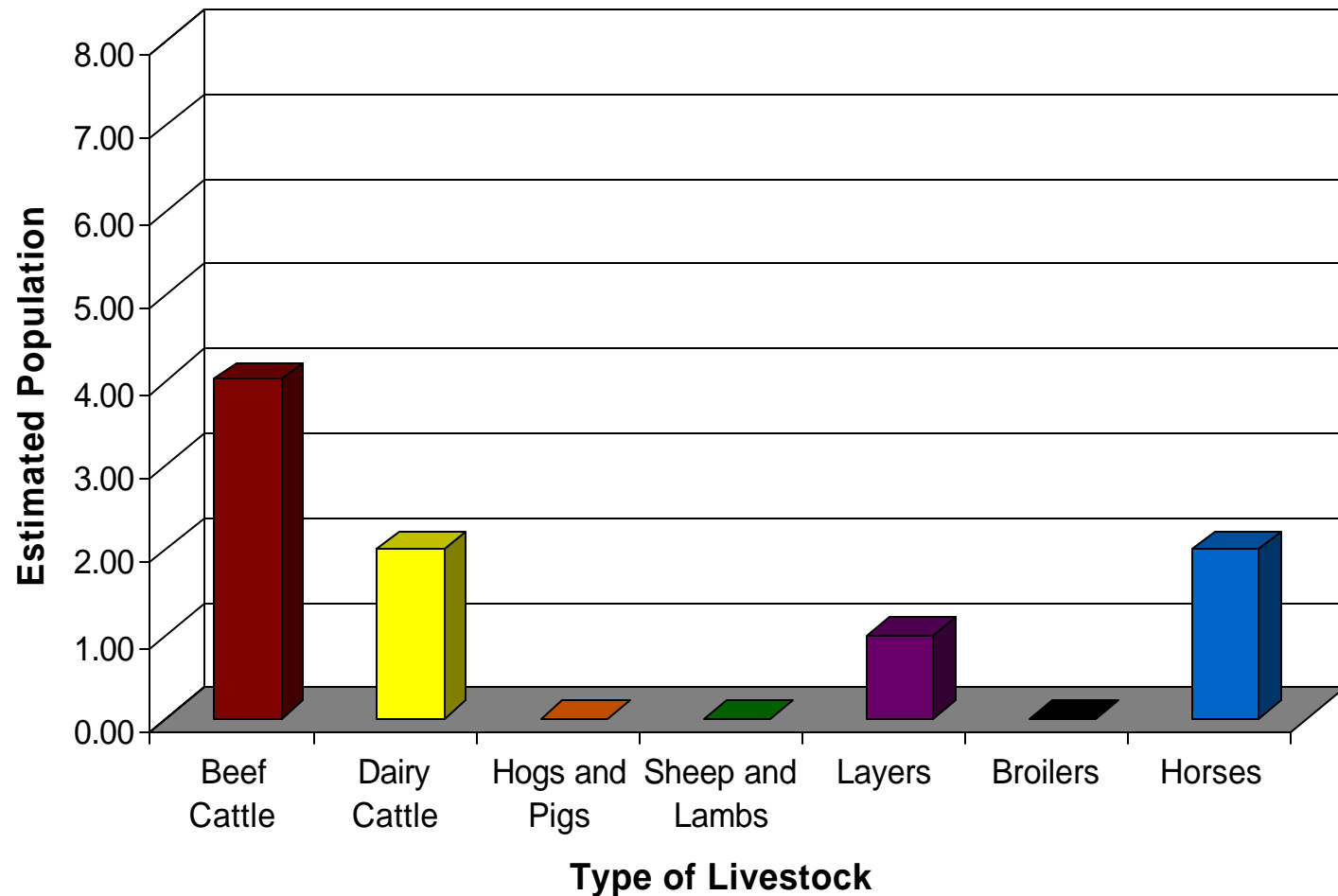
Water quality standards not met



Follow-Up From First TAC Meeting: Updated Information

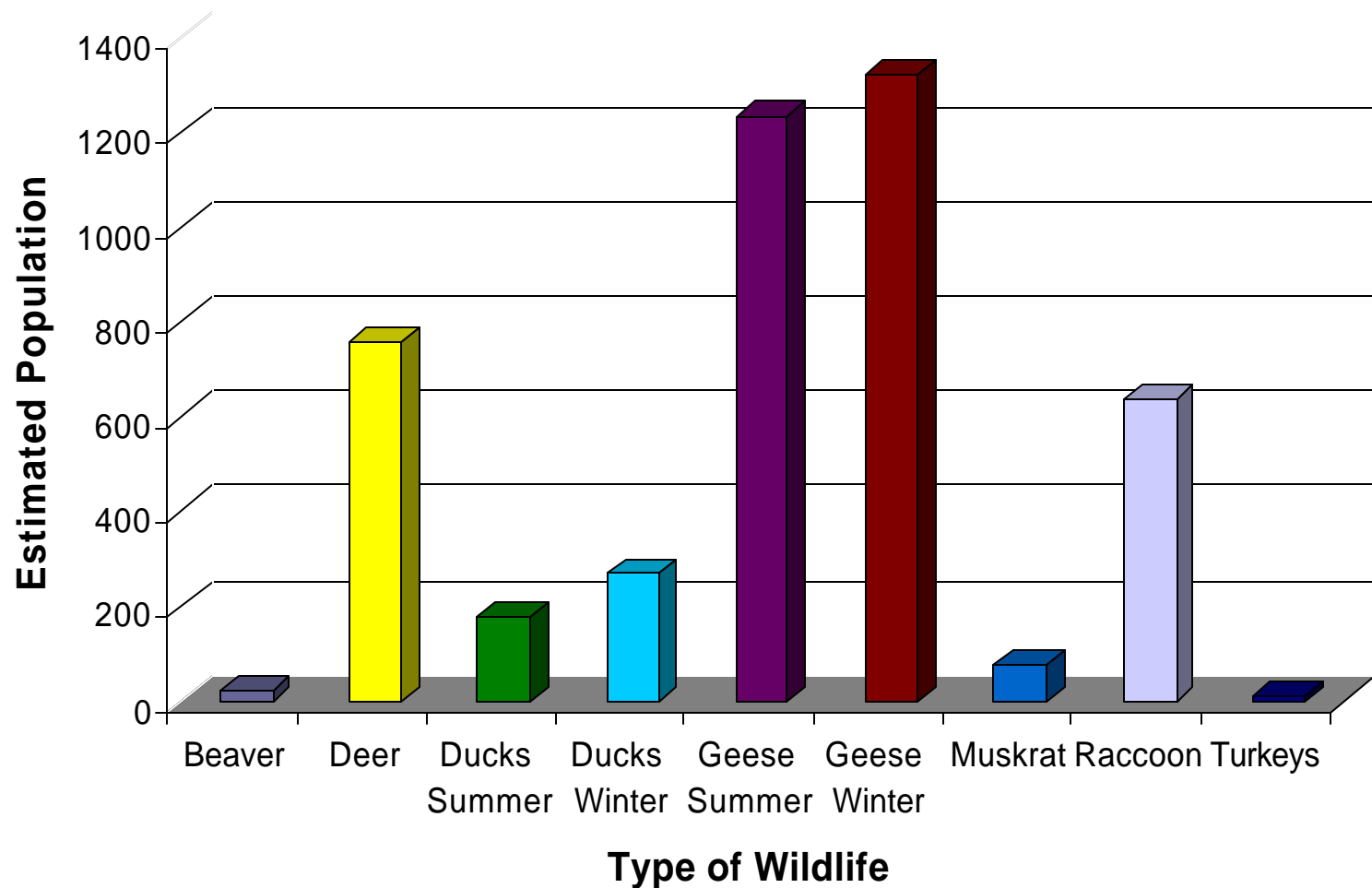
- **Livestock Numbers**
- **Wildlife Numbers**
- **Revised Required Reductions**
- **MS4 Area**

Livestock Estimates in Watershed



*Livestock numbers were estimated using the 2002 USDA Census of Agriculture
http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/

Wildlife Estimates in Watershed

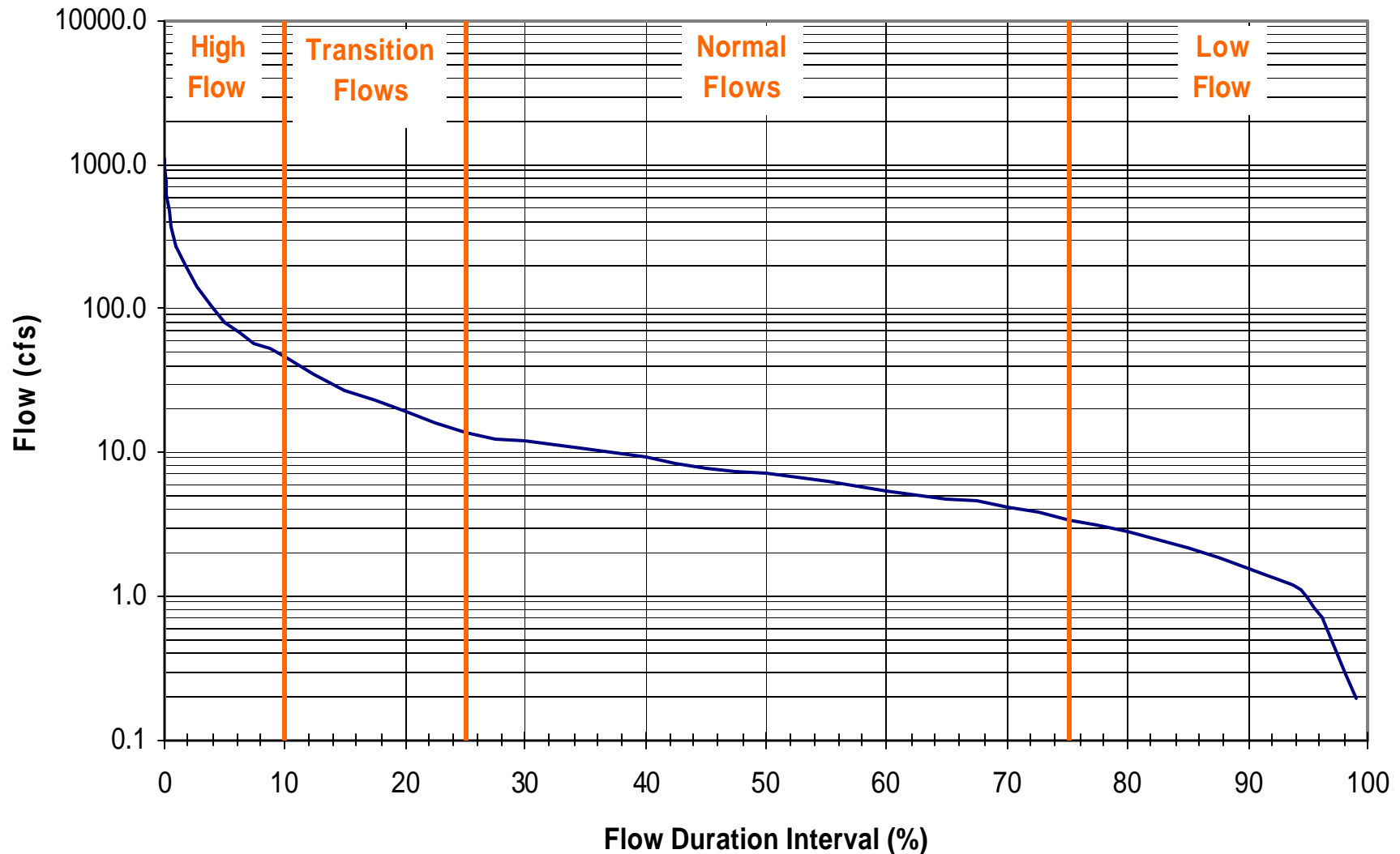


***Wildlife estimates were derived from population density numbers obtained from the Virginia Department of Game and Inland Fisheries (DGIF)**

Technical Approach for Developing the Neabsco Creek TMDL

- **Use the Load Duration Approach**
- **Load Duration Approach:**
 - **Less complex, spreadsheet model for TMDL development**
 - **Approach used for bacteria TMDLs**
 - **Requires the following data:**
 - **stream flow data**
 - **ambient water quality data**
 - **Bacteria Source Tracking analysis for pollutant source identification and quantification**

Neabsco Creek Flow Duration Curve

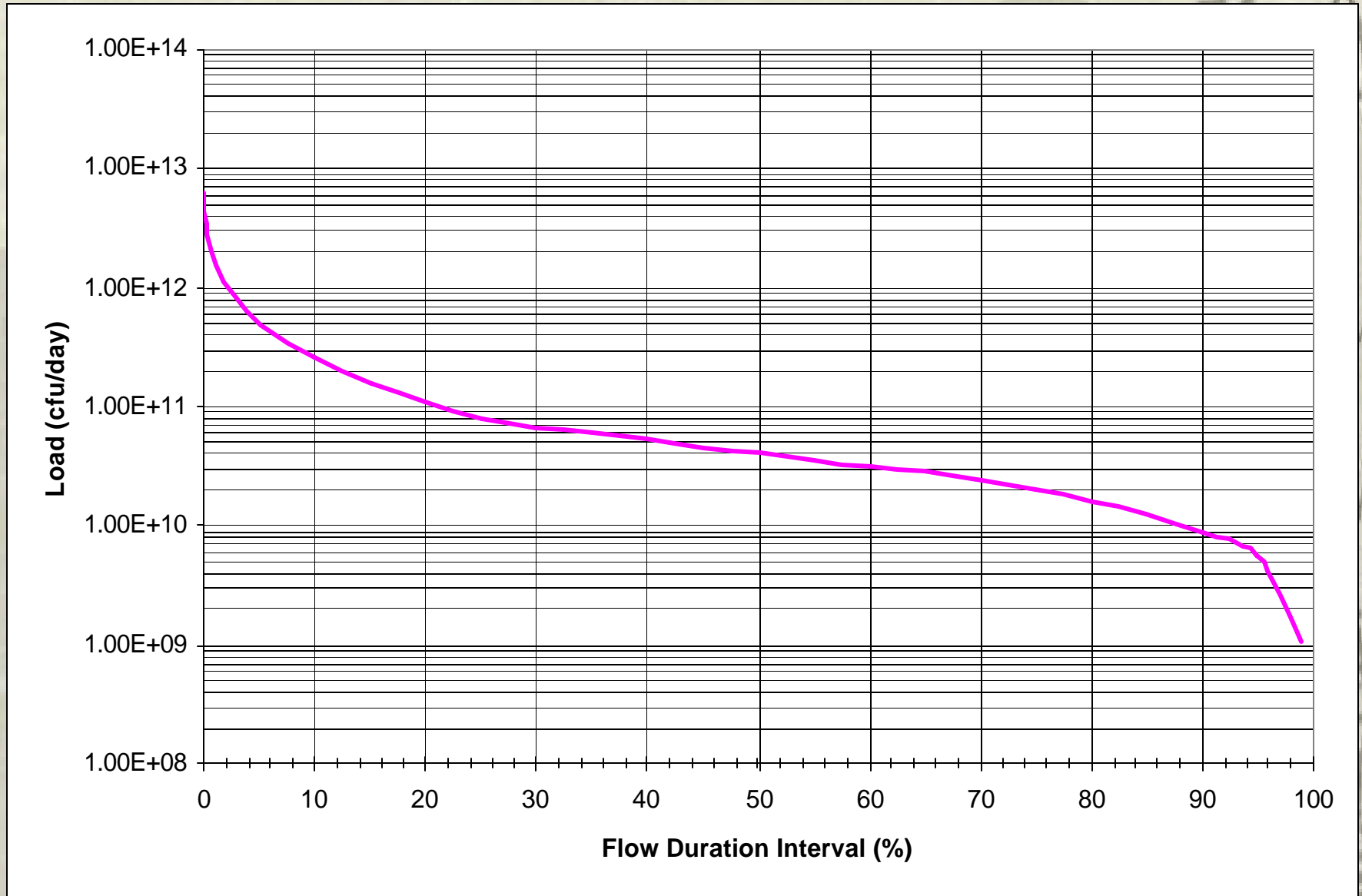


Neabsco Creek flows were computed from the USGS flow gage on Accotink Creek adjusting for drainage area.

Load Duration Curve

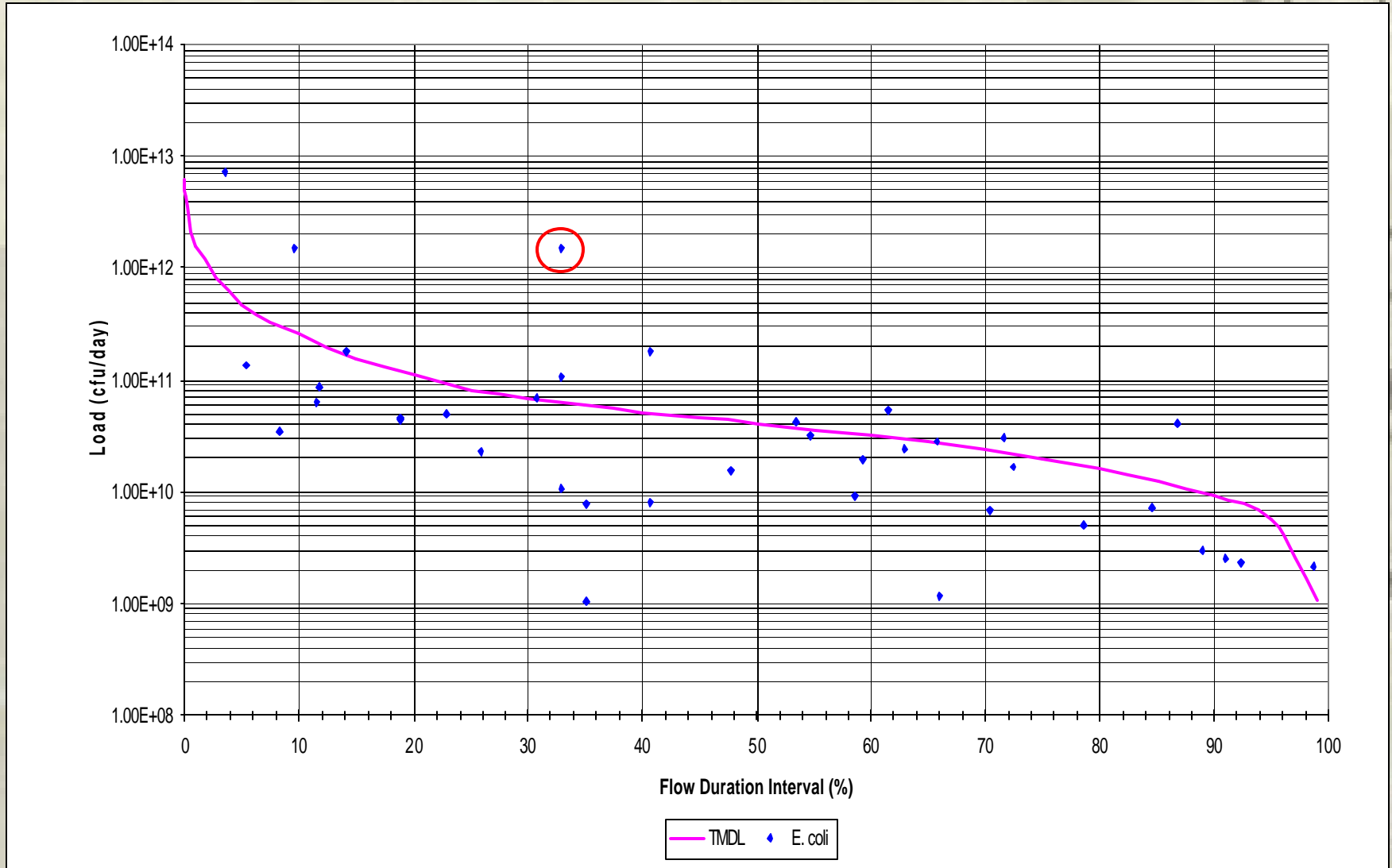
- **Maximum Amount of Pollutant Allowed at Each Flow Level**
- **Multiply Flow Duration Curve by Water Quality Standard**
- **High Flows = More Assimilative Capacity**
- **Low Flow = Less Assimilative Capacity**

Neabsco Creek Load Duration Curve



Neabsco Creek

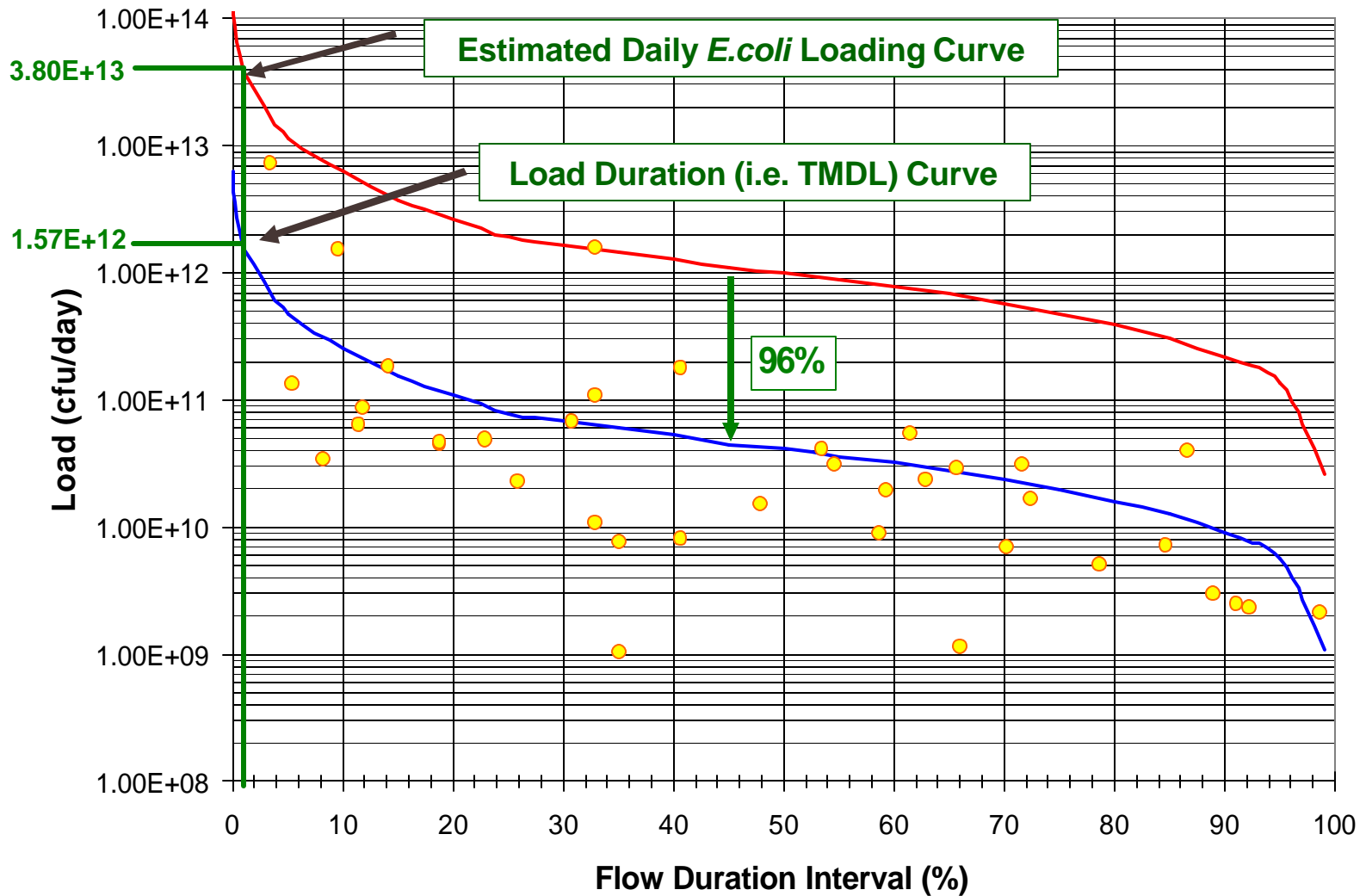
Determining TMDL Reductions



TMDL Required Reduction

- **Ensure water quality is protected during times when stream is most vulnerable**
- **TMDL condition selected to reflect the flow-varying nature of bacteria impairments and based on in-stream data.**
- **In order to capture loadings under all flow conditions, the TMDL is determined for the 99th load percentile, i.e. for the 1% flow duration interval.**

TMDL Reduction



TMDL for Neabsco Creek

| WLA ¹ | LA | MOS | TMDL |
|-----------------------|-----------------------|----------|-----------------------|
| 1.27×10^{12} | 2.97×10^{11} | Implicit | 1.57×10^{12} |

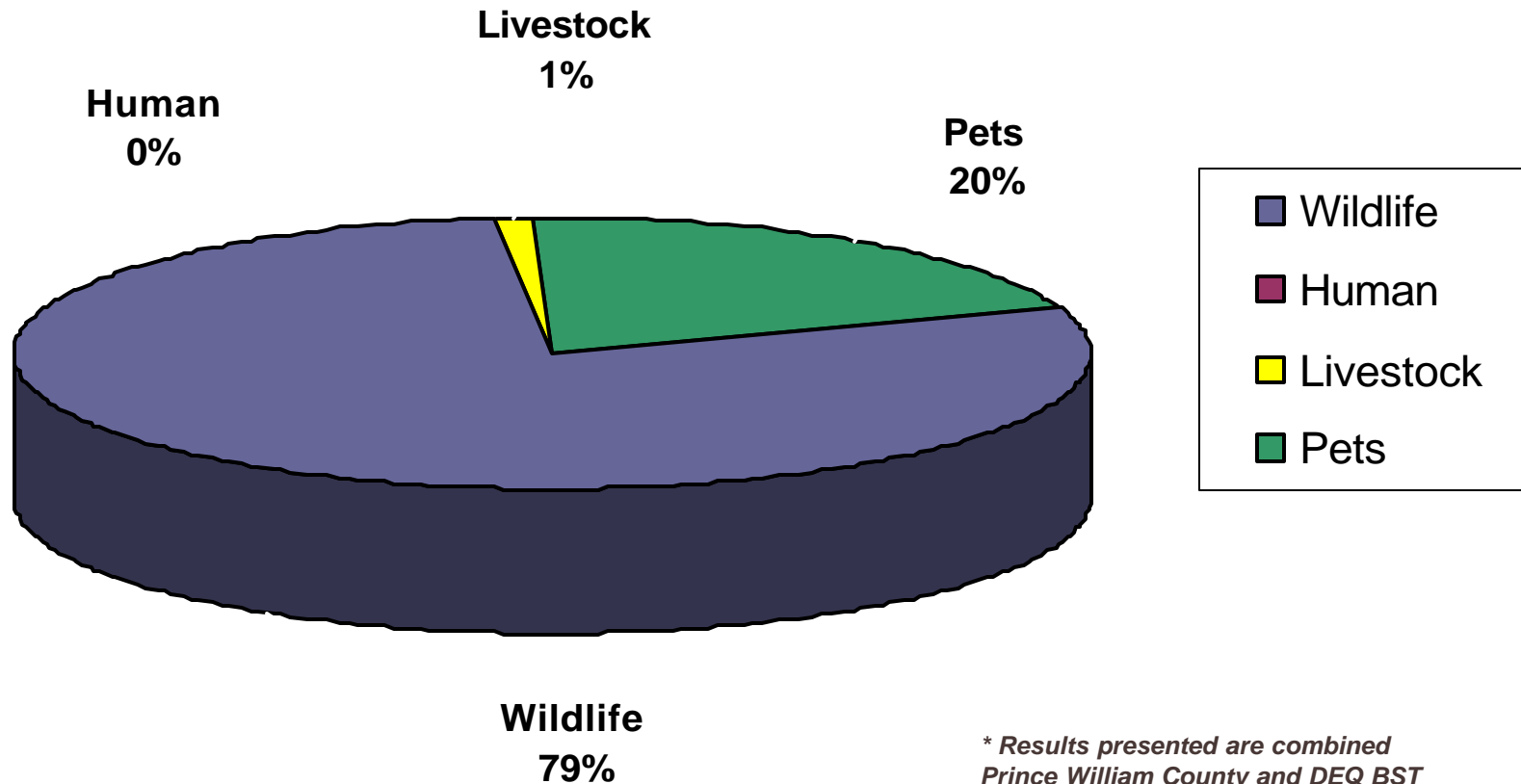
1. WLA includes the allocation for permitted point sources, including MS4 Allocations. It is assumed that 78% of the watershed can be listed as a MS4 area. See Slide 20)

- **TMDL calls for a 96% reduction in bacteria loadings to meet WQS.**
- **BST results indicate the following contributions by source:**
 - **Human: 0%**
 - **Pets: 20%**
 - **Livestock: 1%**
 - **Wildlife: 79%**

Source Contribution

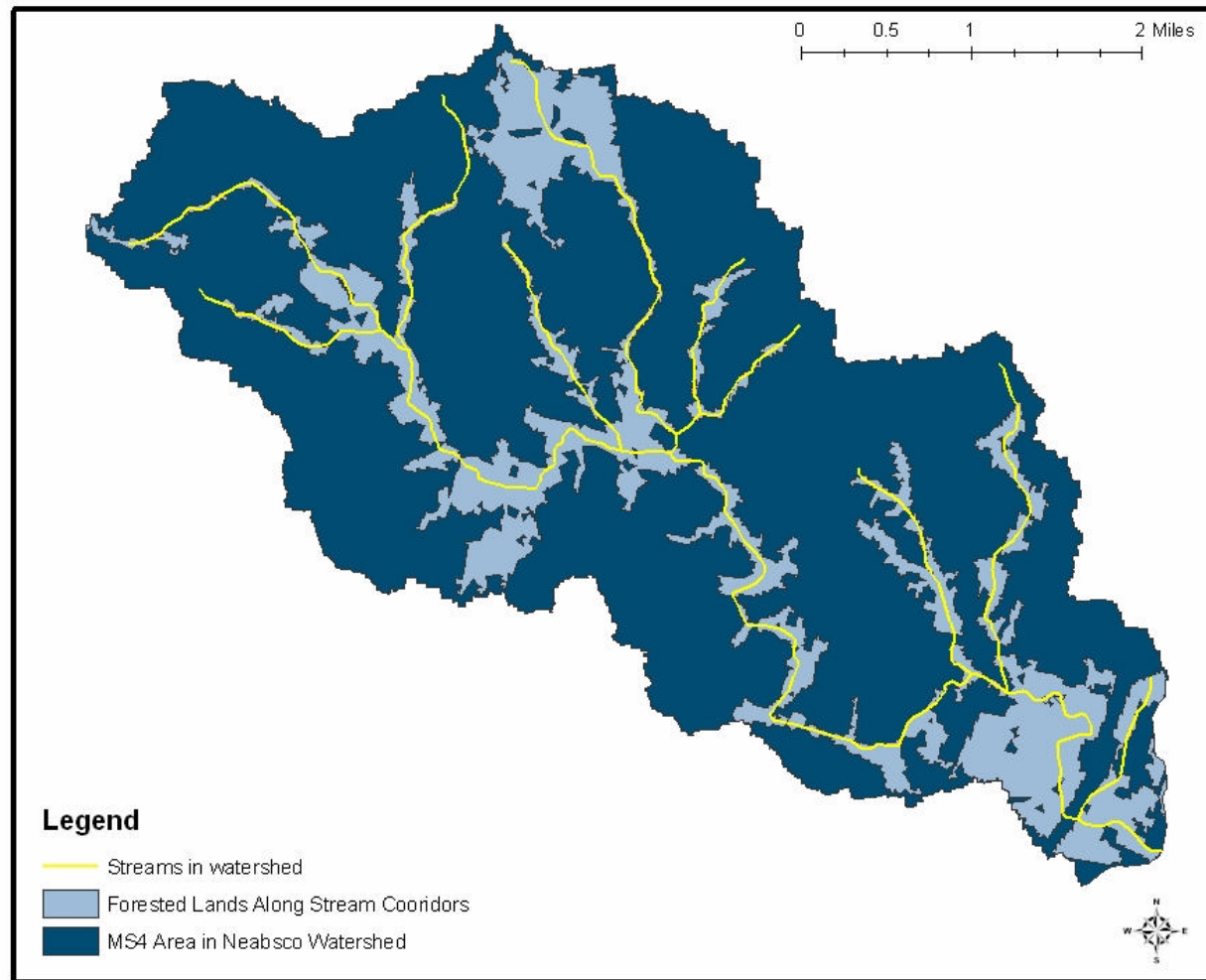
BST Results for Monitoring at Rt. 1

(DEQ Station 1ANEA002.89)



** Results presented are combined Prince William County and DEQ BST data. County data were collected in 2003-2004; DEQ data were collected in 2005-2006.*

MS4 Area



Approximately 78% of the Neabsco Creek Watershed is attributed to a MS4 Area. The remaining 22% of the watershed is attributed to the non point Load Allocation.

Key Issues

- * The watershed assessment supports the BST results in that pets and wildlife are the dominant categories.**
- * This is a wildlife dominant problem. Eliminating all other sources still would predict exceedances of the standard.**
- * While Virginia does allow streams to be redesignated for secondary contact recreation (which allows higher bacteria levels), the downstream portion of Neabsco Creek maintains the primary contact standard.**
- * Pet and other urban control measures will be necessary to reduce bacteria levels and make progress toward achieving goals.**

Stage I Implementation Goals

| | | | | | |
|-----------------|-----|-----|-----|-----|---------------|
| Load Reduction | 96% | 90% | 80% | 73% | Existing Load |
| Exceedance Rate | 0% | 5% | 8% | 10% | 32% |

- **Approximately 73% reduction in source contributions should lead to a 10% exceedance rate of the e. coli criterion.**
- **10% exceedance rate means the stream can be delisted from the §303(d) impaired waters list.**
- **E. Coli data from 2005 through current indicate a 14% exceedance rate of the criterion.**

Next Steps



- **Public Comment Period for TAC Meeting from July 18 to August 17. Send all comments in writing to Katie Conaway (contact information on next slide).**
- **Establish a Public Meeting Date: Sometime the week of August 20 – 24. Draft TMDL Report will be presented at the meeting.**
- **30 Day Public Comment Period following public meeting.**
- **Draft TMDL Report submitted to EPA for approval (late September).**

C O N T A C T S

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